IN THE CLAIMS

Please amend claim 1 as follows:

1. (Amended) A process for decomposing a cumene oxidation product mixture containing cumene hydroperoxide (CHP) and dimethylphenyl carbinol (DMPC) to produce phenol, acetone and alpha-methyl styrene (AMS) with energy savings, enhanced safety of operation and reduced by-product formation which comprises the steps:

(a) mixing the cumene oxidation product in a stirred or back-mixed reactor with an acid catalyst, with 10 to 100 percent acetone relative to the amount of acetone produced during the decomposition reaction, and with [up to 4 weight percent] additional amounts of water, the total amount of added water not to exceed 4 weight percent relative to the reaction mixture, at an average temperature between about 50°C and about 90°C for a time sufficient to lower the average CHP concentration of the reactor to between about 0.2 and about 3.0 weight percent, and wherein a portion of DMPC is converted to dicumyl peroxide (DCP); then

(b) reacting the reaction mixture from step (a) at a temperature between about 120°C and 150°C under plug-flow conditions for a time sufficient to decompose substantially all residual CHP and at least 90 percent of the DCP formed in step (a); then

(c) submitting the reaction product from step (b) to

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adiabatic flash evaporation to recover a water-containing acetone-rich distillate and recycling said distillate to step (a) to provide said acetone and at least a portion of said additional amounts of water.

Cancel claims 3-6, without prejudice.

Please add the following new claims:

--7. The process of claim 1 wherein the CHP concentration is monitored by on-line analysis.

8. The process of claim 2 wherein the CHP concentration is monitored by on-line analysis.

9. A composition comprising cumene hydroperoxide, cumene, acidic catalyst for decomposition of cumene, dicumyl peroxide, dimethylbenzyl alcohol, phenol, and acetone wherein the acetone is present in excess by an amount of 10 to 100 percent acetone relative to the amount of acetone produced during the reaction.

10. A method for the efficient generation of recycle acetone in a process which prepares phenol and acetone from cumene comprising

(a) decomposing dicumylperoxide to phenol, acetone, and alpha methyl styrene

(b) feeding at least a portion of decomposition products of (a) to a separate vessel wherein operating temperature is higher

or operating pressure is lower than step (a), thereby allowing acetone to evaporate,

(c) sending at least a portion of acetone collected from step (b) to the cumene hydroperoxide decomposition reaction.

11. A process for decomposing a cumene oxidation product mixture containing cumene hydroperoxide (CHP) and dimethylphenyl carbinol (DMPC) to produce phenol, acetone and alpha-methyl styrene (AMS) with enhanced safety of operation and reduced by-product formation which comprises the steps:

(a) mixing the cumene oxidation product in a stirred or back-mixed reactor with an acid catalyst, with 10 to 100 percent acetone relative to the amount of acetone produced during the decomposition reaction, and with up to 4 weight percent additional amounts of water relative to the reaction mixture, at an average temperature between about 50°C and about 90°C for a time sufficient to lower the average CHP concentration of the reactor to between about 0.2 and about 3.0 weight percent, and wherein a portion of DMPC is converted to dicumyl peroxide (DCP); then

(b) reacting the reaction mixture from step (a) at a temperature between about 120°C and 150°C under plug-flow conditions for a time sufficient to decompose substantially all residual CHP and at least 90 percent of the DCP formed in step (a).

12. The process of claim 11 wherein step (a) additionally comprises reacting the reaction mixture having an average CHP

concentration of between about 0.2 and about 3.0 weight percent at between 50°C and about 90°C under plug-flow conditions for a time sufficient to produce a reaction mixture having a CHP concentration no greater than about 0.4 weight percent.

13. The process of claim 11 wherein the CHP concentration is monitored by on-line analysis.

14. The process of claim 12 wherein the CHP concentration is monitored by on-line analysis.

15. The process of claim 1 wherein step (a) comprises mixing the cumene oxidation product with 40 to 60 percent acetone relative to the acetone produced during the decomposition reaction.

16. The process of claim 1 wherein step (a) comprises mixing the cumene oxidation product with 40 percent acetone relative to the acetone produced during the decomposition reaction.